

Conclusion: Short-term, goal-directed, robot-assisted arm training is effective for promoting motor recovery of the exercised limb segments after stroke. It improves movement smoothness and facilitates a better coordination between individual joint segments.

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Physiotherapy intervention improves clinical outcomes in patients with Parkinson's disease

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Background and purpose: Parkinson's disease (PD) is an incurable and progressive disease. Physiotherapy plays an important role in the nonpharmacological management at all stages of PD. This study aimed to evaluate the effectiveness of a physiotherapy training programme for patients with PD in the Queen Elizabeth Hospital (QEH).

Methods: Twenty-eight patients (9 females and 19 males) who were diagnosed with PD (Hoehn and Yahr Stages 1–3) attending the Special Outpatient Department of QEH were recruited in the study. They received a course of physiotherapy training programme (including gait re-education, strength, cardiovascular, and balance training) two times per week for 6 weeks. Impairment of the disease was measured by the Movement Disorder Society—Unified Parkinson's Disease Rating Scale (MDS-UPDRS)—Part III. Functional mobility and risk of fall were assessed by the timed-up-and-go test (TUG). Self-perceived balance confidence was measured by the Chinese translated Activities-specific Balance Confidence (ABC-C) Scale. Quality of life was determined by the Parkinson's disease Questionnaire—Standard Chinese Version (PDQ-39). Evaluation was performed at baseline and at the end of treatment.

Results: Upon completion of the programme, the averaged MDS-UPDRS—Part III score reduced significantly from 13.8 to 11.0 (−20.5%, $p = 0.047$). Scores of the TUG reduced from 12.1 seconds to 11.5 seconds (−5.3%), ABC-C scale improved from 77.3 to 83.5 (8.0%), and PDQ-39 reduced from 72.5 to 65.5 (−9.7%) but were not significant.

Conclusion: A physiotherapy training programme for patients with PD in QEH was shown to reduce impairment, improve functional mobility, reduce fall risk, and enhance self-perceived balance confidence. Further studies may demonstrate the long-term effect of physiotherapy in alleviating the symptoms of PD that impact patients' daily functions.

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Novel intervention for neurological patients with moderate to severe gait dysfunction: A robot-assisted gait training system

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Background and purpose: Gait training plays an important role in restoration of daily activities and enhancement of quality of life, especially for survivors of neurological insults such as stroke, spinal cord injury, traumatic brain injury, cerebral palsy, and multiple sclerosis. With the heavy workload of the public healthcare sector in Hong Kong, it has always been very difficult for physiotherapists to offer gait retraining to patients with moderate to severe neurological disability. This is because gait retraining for such patients is often labour intensive and physically stressful to both physiotherapists and patients. Implementation of a robot-assisted gait training system may fill in the gap by offering more intensive gait retraining to the neurological patients without causing much additional physical stress to both therapists and patients. A single-group pretest–post-test quasiexperimental design was developed to evaluate the effectiveness of implementing a robot-assisted gait training system for patients with different kinds of neurological disorders, presenting with moderate to severe gait dysfunction.

Methods: From January 2011 to April 2013, 78 neurological patients with moderate to severe gait dysfunction after stroke, spinal cord injury, traumatic brain injury, or multiple sclerosis had been offered an additional 30–45 minutes of

robot-assisted gait training, three times per week for 12 weeks. Outcome measures included Modified Functional Ambulatory Category (MFAC) score, gait speed, walking capacity, spasticity measurement, Berg Balance Scale (BBS), and Modified Barthel Index (MBI). Paired sample t test (continuous variables) and Wilcoxon signed-ranks test (categorical variables) were used.

Results: The median MFAC improved from 3 ± 1 to 4 ± 1 ($p = 0.001$). The gait speed improved by 66.9% ($p < 0.001$) and the walking capacity by 48.4% ($p < 0.001$). In addition, spasticity reduced by 20% ($p = 0.036$), as measured by the passive resistive torque over the hips and knees. The BBS and MBI scores increased by 44.3% ($p = 0.004$) and 11.1% ($p = 0.002$), respectively.

Conclusion: Robot-assisted gait training is effective in reducing spasticity, improving balance, and reducing disability and gait-related parameters in neurological patients with moderate to severe gait dysfunction.

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Timely physiotherapy work rehabilitation programme for work-injured government employees at an occupational health clinic

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Background and purpose: A timely intervention is crucial for a work-injured worker for the reduction of long-term physical disability and retention of productive workforce. The First Occupational Health Centre (OHC) for government employees was established at Queen Elizabeth Hospital in June 2011, to provide an immediate intervention to work-injured government employees. Fast-track physiotherapy appointments and tailor-made work rehabilitation training incorporated with specific ergonomic advice are the characteristics of the physiotherapy work rehabilitation programme ("the programme"). Job analysis is performed to identify the injured workers' occupational work demand. According to their different physical work requirements, an 8-week tailor-made programme with physical reconditioning, job-related functional training, and work simulation training are then devised and provided. The aim of this study was to evaluate the service outcomes of physiotherapy management for work-injured workers at OHC.

Methods: A retrospective study was conducted. Patients who had completed the programme within the period of June 2011–May 2013 were studied. Demographic data were collected. Clinical and functional outcomes, including pain, functional impact, and health-related quality of life, were evaluated. Postdischarge work status was also examined.

Results: One hundred and thirty cases were reviewed. All patients entered the programme within 2–3 days. Forty-five per cent of the cases worked at a medium physical work demand or above. The most commonly injured body parts were back (30%), followed by knee (16%) and ankle (13%). A significant reduction of pain ($p < 0.001$) from 5.8 to 1.8 was observed on the Numeric Pain Rating Scale. Functional impact and quality of life improved significantly in terms of pain interference score and Short Form-12 score ($p < 0.001$). Upon discharge, all patients resumed full or modified duty.

Conclusion: A timely comprehensive physiotherapy work rehabilitation programme for an injured worker can reduce their work disability and enhance their return-to-work outcomes.

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Evaluation of a return-to-work cognitive-behavioural-based physiotherapy rehabilitation programme for the management of acute back pain

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Background and purpose: Low back pain is a common medical and social problem associated with disability and absence from work. An early and effective intervention is very important to prevent acute low back pain from developing into chronic pain and disability. Effective disability prevention and screening of risk factors are essential for acute back pain patients. The objectives of the study were as follows: (1) to provide effective intervention and management for back pain patients with better

accessibility of care; (2) to prevent acute back pain from developing into chronic pain and disability; (3) to employ a tailored-made early intervention programme to acute back patients with high risk of developing chronicity to prevent the development of chronic disability; and (4) to facilitate an early return-to-work for work-related injury patients.

Methods: A "pretest" versus "post-test" design was employed. Inclusion criteria were as follows: (1) patients aged 18–65 years; (2) back pain for less than 8 weeks; (3) injury on duty; and (4) motivated to participate in the programme. Patients with high fear avoidance beliefs [Fear-Avoidance Beliefs Questionnaire (FABQ)-Physical Activity ≥ 14 and FABQ-Work ≥ 34] were invited to join the cognitive behavioural-based physiotherapy programme (CBT). Outcome measures were as follows: (1) Numerical Global Rating of Change Scale (NGRS) for subjective reported improvement; (2) Numeric Pain Rating Scale (NPRS) for intensity of pain; (3) Roland Morris Disability Questionnaire (RMDQ) for functional disability; (4) Hospital Anxiety and Depression Scale (HADS-Anxiety and HADS-Depression) for screening of anxiety and depression; and (5) FABQ-Physical Activity and FABQ-Work for fear-avoidance belief. SPSS software version 11 was used to analyse the data.

Results: From 13 August 2007 to 18 January 2013, a total of 566 patients (mean age 41.7 ± 23.9 years, 251 females and 315 males) with high fear avoidance beliefs were recruited. Out of them, 448 patients completed the CBT programme. All the outcome measures, including subjective reported improvement, intensity of pain, functional disability, anxiety and depression mood, and fear avoidance belief, were improved significantly. The mean value of NGRS was 6.9 ± 3.0 . The postprogramme evaluation of NPRS (from a mean value of 7 ± 1.7 to 4 ± 2.1 , $p < 0.001$), RMDQ (from a mean value of 15 ± 4.8 to 11 ± 6.5 , $p < 0.001$), HADS-Anxiety (from a mean value of 12 ± 4.4 to 11 ± 4.6 , $p < 0.001$), HADS-Depression (from a mean value of 12 ± 4.6 to 10 ± 4.6 , $p < 0.001$), FABQ-Physical Activity (from a mean value of 23 ± 3.1 to 18 ± 5.7 , $p < 0.001$), and FABQ-Work (from a mean value of 37 ± 2.5 to 29 ± 5.5 , $p < 0.001$) showed that these values were improved significantly. The return-to-work rate was found to be 55.1%.

Conclusion: The outcome of our study was found to be comparable with a similar study (Johnson et al, 2007), which demonstrated a change of 1.7 in the NPRS score and 3.2 in the RMDQ score in their intervention group using a cognitive behavioural approach to encourage self-management of back pain as well as a paced activity home programme. Therefore, it showed that a CBT programme with physiotherapy treatment is more effective than a pure CBT programme in terms of decreasing back pain, functional disability, fear-avoidance behaviours, anxiety, and depression mood in patients with work-related injury.

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Evaluation of a comprehensive empowering preoperative and postoperative physiotherapy management programme for patients with lumbar spine pathologies

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Background and purpose: Previous studies have revealed that pain was influenced by biological, psychological, and social factors. In particular, the psychological factor was found to have a significant impact on the outcome of elective spine surgery. Thus, a comprehensive empowering management programme was established for patients with lumbar spine pathologies in order to enhance their function after lumbar spine surgery with a physical conditioning programme, optimisation of their psychological preparation, and expectation management of the surgical outcomes.

The programme included preoperative physical assessment, education on the postoperative management, alignment of surgical outcomes by having a sharing session with the previously operated patients and a structured postoperative conditioning programme with reference to patients' psychological factors in terms of their level of anxiety and fear-avoidance beliefs. The objective of this study was to evaluate the effectiveness of implementing the comprehensive empowering programme in improving back pain, restoring functional activities, resuming work duties, and alleviating the psychological factors in anxiety and fear-avoidance beliefs for patients who underwent lumbar spine surgery.

Methods: Patients with lumbar spine pathologies including lumbar stenosis, spondylolisthesis, and prolapsed intervertebral disc (excluding those

with spinal cord injury), who had undergone a lumbar spine surgery, were recruited. The comprehensive empowering programme consisted of a preoperative education session and an intensive postoperative physiotherapy training session, which included pain relief, muscle strengthening, and cardiovascular and functional training. In the educational session, patients were educated on the expected outcome after surgery and the postoperative training programme in the acute and ambulatory phases. Regular meetings and follow-ups involving patients, surgeons, and physiotherapists were conducted to evaluate the patient's progress and to adjust the treatment plan accordingly. Outcome measures included the following: (1) Numerical Global Rating of Change Scale (NGRCS) for subjective improvement; (2) Numeric Pain Rating Scale (NPRS) for pain level; (3) Roland Morris Disability Questionnaire (RMDQ) for level of functional limitation due to back pain; (4) Fear-Avoidance Beliefs Questionnaire (FABQ) for fear-avoidance beliefs; and (5) Hospital Anxiety and Depression Scale (HADS) for anxiety and depression. Data were collected preoperatively, at the first postoperative session, and at the final physiotherapy session.

Results: From July 2008 to January 2013, 258 patients (151 males and 107 females; mean age 53.9 ± 12.3 years) with lumbar spine operation completed the programme. The mean number of physiotherapy sessions was 21 ± 11 , with an average duration of postoperative physiotherapy of 123 ± 71 days. The NPRS (from 6.1 ± 2.0 to 3.1 ± 2.1), RMDQ (from 13 ± 2.9 to 10 ± 5.3), FABQ-Physical Activity (from 19 ± 3.3 to 13 ± 3.2), FABQ-Work (from 26 ± 3.2 to 21 ± 3.1), and HADS-Anxiety (from 10 ± 4.6 to 5 ± 4.3) scores were improved significantly ($p < 0.05$) from the preoperative to the final physiotherapy session. Furthermore, the NPRS (from 4.2 ± 1.9 to 2.9 ± 2.0), RMDQ (from 14 ± 2.6 to 7 ± 3.8), FABQ-Physical Activity (from 17 ± 3.1 to 12 ± 5.5), and FABQ-Work (from 25 ± 3.1 to 19 ± 3.0) scores were also improved significantly ($p < 0.05$) from the first postoperative to the final physiotherapy session. In addition, the work status was improved significantly, as demonstrated by an increase in the percentage of working population from 21.3% to 48.1% due to improvement in pain and functional capacity. Subjective improvement, as measured by the NGRCS, was increased significantly ($p < 0.05$) from 4.9 ± 2.5 to 7.1 ± 2.1 from the first postoperative to the final physiotherapy session.

Conclusion: A comprehensive empowering pre- and postoperative physiotherapy management programme was found to be effective in improving back pain, restoring functional activities, resuming work duties, and alleviating the psychological factors in anxiety and fear-avoidance beliefs for patients undergoing lumbar spine surgery.

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Initiation of an early mobilisation programme in intensive care units—A preliminary report

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Background and purpose: Immobility is one of the causes for significant long-term impairment in critically ill patients. Several studies indicated that early mobilisation in intensive care units (ICUs) was safe and improved functional status upon hospital discharge. Structured mobility protocols with an early physiotherapy intervention have demonstrated a reduction of length of stay (LOS) in ICUs.

However, staff in local ICUs believed that mobilising the patients is clinically unsafe. This will probably delay the rehabilitation process and subsequently prolong the length of hospitalisation. Therefore, a programme of early mobilisation was implemented in local ICUs to demonstrate the effectiveness of early mobilisation on the length of hospitalisation and patients' functional status. The objective of this programme was to study the practicability of an early mobilisation programme in ICUs.

Methods: The target patient population of the first phase of this programme was patients who underwent open hepatobiliary surgeries (HBS) and required postoperative ICU care. Patients with unstable haemodynamics, frequent desaturation, recent acute myocardial injury or arrhythmia, and recent administration of inotropic agents were excluded. A four-level exercise protocol was established based on patients' conscious level and strength of large muscle groups. The protocol embraced a progressive regime, which ranged from a passive range of motion therapy, neuromuscular electrical stimulation, muscle-strengthening exercise to upright activities such as sitting at bedside, standing exercise, and ambulatory training. Upon discharge from the ICU, the progress of patients was followed in the general wards. The LOS in ICU,